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The BULLETIN of the AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS

Volume 17, Number 2

May 1957

THE BULLETIN OF THE AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS

Published Quarterly by the Association
Fred Wertheimer, Publisher
Michigan Department of Health, Lansing 4, Michigan

Volume 17 May 1957 Number 2

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Information concerning business matters of the Bulletin, including subscriptions and requests for copies, should be directed to the Publisher. Communications regarding manuscripts, announcements, and news items should be directed to the Editor.

Subscription price, $2.00 per year; single numbers, when available, 50¢.

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THE SERVICES WHICH A PRACTICING DENTIST CAN RENDER IN THE GENERAL REHABILITATION PROGRAM*

M. Michael Cohen, D. M. D.**

"To live is not to live for one's self alone; let us help one another. However distorted or wretched a fellow mortal may be he is still a member of our common species."

Although these quotations are from an ancient king and philosopher, they are still applicable to the handicapped and to our programs of rehabilitation. The allied efforts of dental, medical, and public health agencies can help to make these unfortunate people useful, self-sufficient and reasonably well adjusted members of society.

During the past decade parents of handicapped children have organized and, in conjunction with existing agencies, have made a concentrated effort to improve the status of these children, educationally, socially, and physically. This activity has stimulated considerable research in many universities, directed at the multiple problems that arise from handicapping conditions. Rehabilitation centers and health agencies, as well as medical and dental colleges, have, in addition, enlarged and improved their facilities and personnel in order to render a more complete service to the handicapped child. Although progress has been encouraging, many more clinics and rehabilitation centers, manned by both medical and dental personnel, are needed to maintain and improve the standards of the accumulating health services. With the increase in child population in the United States, the number of handicapped children is certain to multiply; physicians and dentists will have to devote more and more of their time and skills to their care.

The handicapping conditions observed in the United States are briefly as follows:

Neuromuscular Diseases

Cerebral Palsy

This is a neuromuscular disability caused by damage to the motor centers of the brain, either before birth or during infancy. Such damage causes varying disturbances of motor function such as spasticity, weakness, incoordination, athetosis, rigidity, or tremors. These dysfunctions may be accompanied by mental retardation, sensory disorder, convulsions, ear and eye disabilities, or behavior disorders. When the brain tissue is injured, it heals by the production of scar tissue, and the areas destroyed do not function. At present

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* Presented at the Annual Meeting of the American Public Health Association, Dental Health Section, Atlantic City, N. J., November 16, 1956.

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there is no solution to this problem and therefore no cure for cerebral palsy. Approximately 550,000 individuals in the United States are afflicted with this disease.

Muscular Dystrophy

The cause of this chronic, degenerative noncontagious, progressive disease, which is manifested by weakness and wasting of the voluntary muscles, is unknown. Some authorities believe that it is due to imperfect or faulty nutrition of the muscles, and that abnormal functioning of the body's complex chemical process causes the muscles to degenerate until they are useless. Heredity seems to be a factor in about a third of all cases. Two thirds of the patients are between the ages of 3 and 13. There are approximately 200,000 individuals with muscular dystrophy in this country.

Multiple Sclerosis

Multiple sclerosis is a chronic, crippling disease of the nervous system which affects about a quarter of a million Americans, most of them between the ages of 20 and 40. In this disease, the myelin that surrounds the nerve pathways is destroyed in patches and is replaced by scars. As a result, nerve impulses cannot be properly transmitted from the brain to the muscles and other organs which they activate.

Mental Retardation

The causal factors of mental deficiency in children are many and may occur either in the prenatal or the postnatal period. In the prenatal period they may be either genetic (dominant, recessive, or sex linked) or environmental. Disturbances in maternal nutrition, such as vitamin and mineral deficiency, may result in malformations and mental disorders. Exposure to radiation during pregnancy may affect embryonic differentiation and fetal growth and development. Viral infections in the mother, such as rubella and mumps, during the first trimester of gestation often give rise to fetal anomalies. Birth injuries, anoxia, traumatic injuries, and brain hemorrhage are also associated with mental deficiency.

Dental Conditions

Malformation of the teeth and jaws is common in the handicapped child. Children with cerebral palsy, particularly the athetoids, may have narrow, long dental arches with high palatal vaults. They have little or no control over muscular movements. When the musculature of the mouth, throat, and cheeks is affected, swallowing and speech are involved. Inability to swallow solid food necessitates a liquid or soft diet, which is likely to be inadequate. Malnutrition and mineral and vitamin deficiencies, as well as poorly calcified teeth and bones result. Rampant caries and periodontal disease are common findings due to cariogenic diets and leglect of oral hygiene in the home. When these children are first seen by the dentist, fetor oris, accumulated rampant

caries, and enlarged and inflamed gingivae are present. Often the tongue or oral mucous membrane presents manifestations of multiple vitamin deficiency.

Parental education on balanced, noncariogenic diets and home oral hygiene, which in most instances must be performed by the parent, will improve the oral condition in the severely handicapped child.

Periodontal Disturbances

Bruxism, or grinding of the teeth, occurs frequently in children with cerebral palsy. It may begin at an early age and appears periodically, with or without a stimulus. A disturbance in any other part of the body or a traumatic experience such as extraction of a tooth will precipitate the bruxism for several days, weeks, or months. Bruxism causes abnormal wear of the teeth, which in many cases are abraded to the gum line. It has also been observed in normal children and adults. Supragingival and subgingival calculus is especially common in the cerebral palsied and mentally retarded child, and if it goes untreated the gingivae and alveolar bone manifest early periodontal disease. Gingival enlargement and inflammation are frequent in handicapped children who are mouth breathers. Cerebral-palsied and mentally retarded children who have epileptic seizures and are on Dilantin therapy often have gingival hyperplasia with fetor oris. The lack of muscular coordination of the mouth, cheeks, and pharynx in cerebral palsy plays an important role in the production of gingivitis and early periodontal disease.

Mentally retarded children, especially mongoloids, have severe malocclusion, missing teeth, or macroglossia. Many of them show early periodontal disturbances with severe bone loss in the mandibular incisor region. Supragingival and subgigival calculus as well as gingival inflammation and enlargement were constant findings in a recent survey of 2,000 mentally retarded children in institutions.

Some of the factors that contribute to the high incidence of periodontal disturbance in the mentally retarded child are as follows:

1. Lack of oral hygiene
2. Lack of dental care and supervision or oral physiotherapy
3. Food impaction
4. Inherited or congenital weakness of the periodontium, (as in Mongolism)

Dental Treatment

The majority of handicapped children may be treated successfully in the dental office or clinic.[3] Children who are not too severely affected physically and mentally can be trained to become cooperative patients. Proper medication is essential in a large number of patients to allay fear and reduce

rigidity and spasticity. Meprobamate and combinations of barbiturates and Demerol are effective in sedating and relaxing such patients. Some of these children have to be held by the parent on the dental chair while the operative procedures are performed.

The Blind Child

Dental treatment of blind children can be carried out successfully, but the dentist must always remember that the blind child can understand and accept a new experience better if he is told about it in detail beforehand. The dentist must relate the story of dental health and treatment appealingly. Before any instrument is used the child should be permitted to feel it while the dentist tells how it is used.

The Deaf and Mute Child

The deaf and mute child must be shown the dental armamentarium and the instruments. If possible a parent or attendant who is able to communicate with the child, either orally or manually, should be present. The dentist can give this person the necessary dental information for transmittal. Burs and hand instruments may be tried first on the fingers and fingernails so that the child becomes aware of the feeling of a cutting instrument as well as a revolving instrument.

Mouth Rehabilitation with General Anesthesia

The first dental service for the handicapped child should be performed in the chair if possible. If the child cannot be worked on, he should receive Meprobamate or a combination of tranquilizing agents (Tolseram, Miltown, or Equanil) and sedative drugs (Demerol or barbiturates).[2] If this fails the patient must be hospitalized and the entire mouth restored under general anesthesia.

Handicapped patients who require a general anesthetic for mouth rehabilitation should be hospitalized a day before the operation. Preoperative measures should include a thorough physical examination, as well as urinalysis, chest x-ray examination when indicated, and blood studies, including differential count, hemoglobin, and bleeding and clotting time. The department of anesthesiology after consultation with the resident pediatrician then prescribes the premedication and the type of anesthetic to be used.

The anesthetic agents used are combinations of pentothal and nitrous oxide or trichlorethylene in combination with nitrous oxide in a semiclosed system, with succinylcholine given intravenously as a muscle-relaxing agent. With these newer anesthetics it is possible to keep patients under general anesthesia for long periods of time without any ill effects.[1] Because of the danger of electrostatic sparks from the dental engine, noncombustible anesthetic agents are employed throughout the operative procedure.

Present Attitudes and Prejudices

Social prejudice against handicapped children has grown out of a prolonged desire of mankind to rid itself of problems it believes unable to cope with in a more acceptable manner. The general practitioner of medicine and dentistry has little or no knowledge of the multiple special professional skills and long-term attention required in rehabilitation of the handicapped.

At present the dentist is reluctant to treat children with handicapping conditions for the following reasons:

1. The time spent in care and treatment is not as rewarding economically as it is in normal children.

2. It is inconvenient to have handicapped children in the waiting room with normal children.

3. There is insufficient understanding of handicapping conditions and their problems.

4. Understanding and love of children are absent.

5. There is neglect of civic responsibility.

The Educational Program

Interest of dentists in rehabilitation programs and their participation therein are possible only through education at the undergraduate and postgraduate levels. Recently several dental colleges have expanded their clinical facilities for the care of the handicapped child and are exposing the undergraduate dental student to these patients.

Several years ago a three-day postgraduate course in dentistry for handicapped children was instituted at the University of Pennsylvania, to help practitioners of dentistry understand the dental conditions and treatment of children with neuromuscular disease and mental retardation. Lectures and demonstrations by a pediatrician, psychologist, anthropologist, speech therapist, and two dentists gave the participating dentist a comprehensive understanding of the multiple problems encountered in a general rehabilitation program. This course has been one of the most successful postgraduate courses.

In 1955, Dr. Earl G. Ludlam, Chief of the Bureau of Dental Health in the State of New Jersey, initiated for the first time in the United States a program of postgraduate study in dentistry for handicapped children at this same university. Forty-eight dentists from the twelve component dental societies in New Jersey participated in these courses. The tuition and expenses were provided by the New Jersey State Department of Health through the Bureau of Dental Health. According to its founder, this course is much in demand and is well appreciated by those dentists who have participated in it.

The Academy for Oral Rehabilitation of Handicapped Persons, of which I am President, although a comparatively new society, has already made definite

contributions in oral rehabilitation for the handicapped. Its goals are as follows:

1. To promote and maintain high standards of dental care and treatment of physically and mentally handicapped persons.

2. To encourage and assist dental practitioners to prepare and qualify themselves to treat physically and mentally handicapped persons.

3. To promote research in all branches of dental care and treatment of physically and mentally handicapped persons.

4. To work with private and public health agencies as members of a team in a general rehabilitation program.

Satisfactions and Opportunities

In addition to the personal satisfaction derived from successful treatment of the handicapped child, there are many valuable social and professional results. The dentist has an opportunity to share with the parent the many complicated problems encountered in the development of these children. Appreciation of dental service on the part of parents and local organizations creates good will for the profession. Furthermore, the dentist comes in close contact with the civic-minded members of the community who are interested in rehabilitation of the handicapped. They also have an opportunity to meet personnel in the allied health fields. Hospital appointments and privileges can be made available to the dentist, and he can share these privileges with the practitioner of medicine. In conclusion, the dentist in a rehabilitation program has an opportunity to expand his services outside of his office and to participate realistically in community programs of rehabilitation. This type of participation will result in improved relations between the dental profession and the lay public.

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THE ROLE OF THE PUBLIC HEALTH DENTIST IN THE FIELD OF PUBLIC HEALTH*

by

Donald J. Galagan, D.D.S., M.P.H.**

A comprehensive analysis of the role of the public health dentist in the field of public health would be so voluminous that it might well be the subject of a book, or worthy of a year's graduate study. It should include consideration of such matters as dental health program content, working relationships with other programs in the public health department, technical subject matter, and, perhaps, an exploration of the philosophy and the social changes underlying the public health movement. Obviously the material presented in a single paper could not do justice to such a complex assignment.

Any individual attempt to define the role of the public health dentist also would be subject to the valid criticism that such an analysis reflected one person's opinion. The chances for developing a reasonably thorough and comprehensive report in this manner are fairly slim. It seemed realistic, therefore, to limit myself to an examination of a few of the more important aspects of dental public health practice. Consequently, I shall attempt to highlight only one or two of the roles which I think the public health dentist might play in the field of public health. Before discussing these roles however, I should like to describe the average public health dentist so that we have some notion of his background, his experience, and something of his personal characteristics.

The chances are that he will not be a candidate for the best-dressed man in his community. The seat of his trousers is apt to be somewhat shiny, for he spends a good deal of time sitting in a swivel chair. Clinicians may think the public health dentist is idle when he sits in that chair, but if the public health dentist is doing his job well, he is engaged in that most difficult of human endeavors - thinking.

The public health dentist may have a wistful look in his eyes when he hears his classmates recount their financial status, or when he sees them whiz by his 1950 sedan in a brand new convertible. Too often, he feels he is underpaid, and with some justification, for when you compare his income to the average for other dental specialists, you will find that he is not compensated equally in dollars.[1,2] It is fair to say that he must collect a certain amount of his pay in what is commonly called "job satisfaction."

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* Presented before the Section on Public Health Dentistry, American Dental Association, Atlantic City, New Jersey, October 3, 1956.

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The public health dentist has difficulty, sometimes, communicating with the dentist in private practice. He uses such poorly understood expressions as DMF or PMA. If you think he is addicted to government alphabetese, let me remind you that in dental school you were referring to MOD's and Ca's. Such phrases simply are short cuts in professional use of long technical terms. The public health dentist talks about standard error and motivation, incidence and prevalence, although one suspects that he is not always quite sure which of the latter means annual increment. The reason he sometimes loses contact with his colleagues is not solely because of special language idiosyncrasies, however, but also because he looks at dental health problems from a different point of view than that of his fellow dentists. One of my purposes here is to explain why his point of view has to be somewhat different.

The modern public health dentist is a specialist requiring skills as unique to his practice as those peculiar to the orthodontist or oral surgeon. A dentist specializing in public health must have at least one year of formal graduate training. He must have a working knowledge of statistics and epidemiology and must understand the principles of education and administration - all things in which he does not receive training in dental school. He probably will have been certified by his specialty board, the American Board of Dental Public Health, which means that he has acquired recognized competence in his chosen professional field.

He also must have certain personal traits to do his job well, characteristics in addition to those assets which are important to every dentist. For example, because he must try to resolve an enormously complex problem with a relatively small amount of money, he must have imagination and ingenuity. Because of the nature of his job, he must be able to withstand the criticism and sharp comment that sometimes are directed at those in public office. And, since one of the major purposes of public health programs is to help people help themselves, he must be able to motivate them and to express ideas effectively in speech and in writing.

It is likely that he has given more serious thought than most dentists to the whole range of dental illnesses suffered by the American people and to the multitude of problems besetting the dental profession. He is interested in you, the practicing dentist, and your welfare, because he is one of you.

I would like now to define dental public health so that we have a common understanding of that term. Dental public health practice is a science, with its own skills and techniques, its own sub-disciplines, its own literature, and its own body of knowledge. The paraphrase of a classic definition of public health practice[3] developed by the American Board of Dental Public Health is brief, very descriptive, and seems most appropriate: "Dental public health is the science and art of preventing and controlling dental diseases and promoting dental health through organized community effort."[4]

The key phrase in this definition is the last one - "through organized community effort." This places the public health dentist in his proper setting, working to improve the dental health of individuals as a group. At the recent Michigan Workshop on Public Health Dentistry, it was suggested that the public health worker "is responsible for the scientific diagnosis and treatment of the body politic"; i. e., the community, whether it be a city, a State, or a

nation.[5] The application of this basic concept of the "community physician," the "community health worker," or the "community dentist" may be found in several interpretations or definitions of public health practice.[6,7] It should be noted that the word community is used hereafter in its generic sense, and does not necessarily refer to a city or town.

Thus, it may be said that any health procedure which is carried out under the auspices of community organizations is public health practice. A city-wide dental health education program, for example, obviously is a public health procedure, since no one individual could carry out a program of this magnitude. It requires group action. Less obvious, but equally appropriate, might be the placement of a filling for a patient eligible for treatment in a community dental service program. It is necessary, sometimes, to render personal health services in the public interest. A personal health service, such as a filling or a topical fluoride treatment, for example, may be rendered through a private health service contract between a practicing dentist and his patient, or through a public health agency. The differentiation between the two is the auspices under which the service is rendered.

Obviously, every personal health service provided by the private dentist contributes to and improves the public health. Private practitioners, as a group, make by far the largest single contribution to the public health by the services they provide to their individual patients. They are not, however, engaged in public health practice, except when they are participating in a community program as volunteers or under public contract.

We may conclude from this short review, therefore, that the public health dentist is a specialist in community dental health, working to improve the dental health of the people in his jurisdiction, and using group or mass techniques whenever possible to accomplish his objectives.

Now to highlight the public health dentist's role in the field of public health. He is first of all, in military parlance, the man at the point. The "Principles of Ethics" of the American Dental Association makes clear that the dentist has an obligation, ". . . to be a leader in his community, especially in all efforts leading to the improvement of the dental health of the public."(8) If this is an obligation of the dentist in private practice, it is even more the duty of the public health dentist who is both an agent of government and a member of the dental profession. Serving as a representative of the people, and as a member of the dental profession, he finds that his obligations, and one might add, his opportunities for leadership, are almost unlimited.

It is the public health dentist's job to attempt to close the gap between the dental health needs and the availability of dental services in his community. The disparity between the level of dental defects and the volume of dental service rendered in a community may be lessened either by reducing the prevalence of dental diseases or by improving and extending the amount of dental health service. To work toward such a broad objective, the public health dentist must be in the forefront of professional and social thought and action on a very complex problem. He must bring new ideas and techniques to the attention of both the consumer and the provider of dental service. He must be able to bring into focus a multitude of ideas, plans, and methods for the improvement

of community dental health. And he must by research, demonstration, and persuasion influence acceptance of advanced methods of improving community dental health.

The dual responsibility of the public health dentist to the citizens, as a public employee, and to the dental profession, as one of its members, fortunately represents a combined rather than a conflicting interest.(9) To define his schizophrenic responsibility in simpler words, the public health dentist works <u>for</u> the people, but works <u>with</u> his fellow dentists.

He has a serious obligation to interpret the dental needs of the population in his jurisdiction to the private practitioners in the area. It has been said that in order to do this properly the public health dentist must serve as the social conscience for the dental profession. Sometimes this task may be difficult but not necessarily divisive. The correct analysis of a social trend may suggest a change in professional action. Proposals for change often imply criticism of the current circumstance and almost always meet with some resistance. However, the public health dentist does the dental profession a disfavor by not interpreting correctly the facts as he sees them from his vantage point. Unpalatable though the facts may be, their early recognition enables the profession to adjust its practices promptly to meet a changing environment.

Two interesting examples of dissimilar reaction to impending change have occurred during the past decade and a half. The advent of community water fluoridation brought the American dental profession face to face with a fundamental decision. Widespread water fluoridation was certain to have some impact on dental practice. Intelligent leadership in the profession, counselled wisely by public health dentists, reasoned that the net effect of reduced caries prevalence as a result of water fluoridation would be a change in the character of dental practice. The dental profession took a positive rather than a negative position on the procedure, and by giving it ardent support dentists gained stature in the eyes of the public. More importantly, from my point of view, the dental profession decided early to adapt itself to a change that was inevitable.

At about the same time that fluoridation was looming on the horizon, the dental profession had the opportunity to participate in the development and promotion of group health service plans. This opportunity was not grasped initially by the profession. Dental participation in the development of group health plans was opposed within the profession, or at best given little support largely because widespread utilization of these plans would mean a change in the character of dental practice. I hasten to add that public health dentists did not play their proper role in interpreting correctly the social changes that were bringing about alterations in the methods of payment for all health service. Consequently, group health plans were organized with but little counsel from the nation's dentists, and to date they provide for little or no dental benefits. Not to have recognized the changing pattern of payment for health service was a lapse on the part of the dental profession. Public health dentistry shares responsibility for this lapse because it failed to alert the profession to the trend. Dentists now are striving to catch up with other health professions in making the most of the group health plan idea.

These two bits of history are recounted to point up the fact that the public health dentist should be in the forefront of events, thinking and talking about

matters that are on the horizon, and to a certain extent, shaping their course. Right now, for instance, he should be working on ways and means of making adequate dental services more readily available to the long-term chronically ill. The signs are clear that this group will constitute an increasing proportion of our population, and that provision of health services for them inevitably will be of community concern, and, therefore, a public health responsibility. If the public health dentist is playing his role properly, he will be doing everything he can to help the dental profession understand and appreciate this problem and prepare to meet it.

Looking at the other side of the coin, the public health dentist has an equal obligation to interpret to the people in his jurisdiction the problems involved in providing good dental services to a total population. He will want to define the implications of unrealistic proposals for broad-scale programs of personal dental health service. Provision of good corrective and restorative dental care to a whole population is extremely difficult at present, although a long-range objective of that scope is not unrealistic. It is the public health dentist's responsibility to describe clearly to everyone concerned the reasons why the objective cannot be achieved overnight and to point out the effect which "easy" solutions might have on the quality of dental health service. The public health dentist must work for the reasonable improvement and extension of good dental health care within the bounds of social and cultural reality.

To examine further the public health dentist's role, I have borrowed two words from the field of physiological chemistry which are most descriptive. I would like to suggest that the public health dentist operates as a "catalyst" and as a "synergist." As a catalytic agent, the public health dentist should be responsible for initiating, or hastening others to initiate, action designed to improve the dental health of the public. As a synergist he should try to combine into an effective and cooperative whole the community's many diverse and often independent efforts to improve dental health.

Let's explore his catalytic role first. The public health dentist himself might initiate directly, through his own official health agency, a new program of preventive dental service to a group of school children in a rural area. Or, he might stimulate another organization, or even one individual, to spark the program, and accomplish the same thing. In both instances, however, the role of the public health dentist had a common factor. In both situations he was the catalytic agent for hastening the action.

Other examples of the public health dentist's catalytic role might lie in the development of a system of case-reporting and follow-up for oral cancer patients, or in the establishment of a program of training dental students to use assistants properly while still in dental school, or a series of traveling seminars on special subjects for the dentists in the state. None of these programs are necessarily of direct functional concern to the public health dentist, but in each, he can provide the stimulus to get them started.

Turning now to the public health dentist's function as a synergist, this role is vitally necessary because of the many different societies, organizations, agencies, and individuals in a community which have an interest in dental health.

It has been pointed out that the practicing dentists in the community make the largest single contribution to the maintenance and improvement of the oral health of its citizens. Many other groups, however, contribute significantly to the dental health of the community. For example, the school system, through its classroom teaching and health education programs; the various voluntary organizations, through their service clinics; the activities of civic minded organizations, such as the Chamber of Commerce, each have a part to play in improving and protecting community dental health. The public health dentist therefore has a primary and continuing responsibility for evaluating and coordinating all of these activities so that the community's dental health efforts will be complementary and effective, rather than competitive or redundant.

Perhaps the best example of the public health dentist's synergistic role may be seen in his potential for the solution to the cleft lip and palate problem. Here the many different disciplines required for adequate rehabilitation frequently carry on each aspect of treatment independently. The team approach, in the treatment of cleft lip and palate, still is the exception rather than the rule. The public health dentist has an opportunity to bring the specialized agencies and professions together to share in a systematic, cohesive community program for the treatment and rehabilitation of the cleft palate child.

In carrying out his roles as catalyst and synergist, the public health dentist plays certain secondary roles, such as interpreter, consultant, evaluator, and educator. For example, he interprets the meaning of new scientific findings to the public. He acts as consultant to many non-dental groups, providing them with the guidance and technical assistance they require as they consider dental health problems and programs. He evaluates the effectiveness of each of the various dental health activities being conducted in the community, so that he can interpret and assess their contribution to the total dental health. He carries on widespread educational programs designed to acquaint the population with the value of good dental health practices.

No discussion of the public health dentist's role would be complete without special reference to the very important relationship he has with organized dentistry. The public health dentist creates unnecessary handicaps for himself if he fails to work with and consult with the dentists in his area, and more importantly, he must keep them fully informed of his plans and activities. All of you are familiar with some of the specific ways in which the public health dentist may accomplish this objective. He may serve on the Council on Dental Health, or help with the preparation or publication of the Journal, and through these mechanisms maintain close contact with the organization of dentistry. However, the important element in this relationship is the one which I hope has been inherent throughout the examples given in this paper. The public health dentist must be sure that the dental profession is involved in the development and execution of every plan which he hopes to carry out. The degree to which the practicing dentists know about and understand proposals put forth by the public health dentist will determine to a large extent the kind of real support they will give to public health programs.

I do not mean to imply from all of this that the public health dentist has any corner on scientific knowledge or social know-how, or that public health is the whole and everything else is a part. The public health worker has no mandate

to concern himself with all health services but he does have a responsibility for them in the very broadest sense. Doctor Hillenbrand, interpreting the American Dental Association's Principles of Ethics, recently pointed out that the dentist (including the public health dentist) need not be all things to all people in solving problems of dental health.(10) The people themselves share this responsibility.

The public health dentist's role in the community is unique, however, since the community is his patient. He will have to persuade the several independent members of his "body politic" to work together to improve and maintain the dental health of the community. The public health dentist should take the best from dental science, sociology, and education, and seek to blend these ideas, and skills, and techniques into action programs to improve the dental health of his community. He will work toward his objectives principally by stimulating thoughtful consideration of the need for action, and by encouraging and coordinating the efforts of everybody concerned with dental health. He will function on a community-wide basis using those techniques and methods which lend themselves to group process.

In short, the public health dentist has a <u>duty</u> to work for the improved dental health of the people who employ him, an <u>obligation</u> to work with his professional peers to accomplish his objectives, and the <u>privilege</u> of performing an important public service. For those of you who wish to sign up, the line forms to the right!

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NURSING IN DENTAL HEALTH PROGRAMS*

Harold R. Harlan**

Tooth decay, the most common disease in man, attacks 95 per cent of our population. Dental caries, which is the greatest single cause for loss of teeth during childhood and adolescence, accumulate many times faster than corrected. Oral diseases, malformations, malocclusion, cleft palate, and harelip contribute to numerous physical, mental, and emotional problems (1).

Under the guidance of the American Dental Association, private dental practitioners and public health dentists have set as their objectives the control or alleviation of these conditions and diseases, and the attainment of the highest possible standards of dental health—a dynamic, continuing, process, an integral part of total health. Dental health "implies biologically perfect teeth structures, disease free and with firm gums and bone structure to support them" (2).

But there are many hurdles the members of the dental profession must clear before they can meet these objectives—inadequate, as well as unevenly distributed dental manpower, the staggering backlog of accumulated dental service needs, the apathy among members of allied professional groups toward comprehensive dental health programs, the public's lack of interest in dental health beyond emergency treatment, and the economic obstacles that keep people from securing optimum dental care.

The backlog of dental service needs and the economic obstacles can best be shown by the following estimates. In our population of 2-year-old children, 50 per cent have one or more decayed teeth. Among our 6-year-olds, 80 per cent have decayed deciduous teeth. Fourteen per cent of our children in the lower primary grades have decay in their newly erupted permanent molars. The average

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* Reprinted by permission from Nursing Outlook, Vol. 5 - February 1957.
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16-year-old has 7 teeth that are decayed, missing, or filled, involving 14 tooth surfaces. Eleven per cent of the children between the ages of 12 and 14 require orthodontic treatment. It is probable that today's children will lose half their teeth before they reach 40. Persons in the low income groups lose their teeth sooner than those in the high income groups (3).

Lined up against these service needs is inadequate dental manpower which is unevenly distributed both geographically and according to population density. To offset this problem, members of the dental profession expect the cooperation of those in the allied professions—physicians, health educators, nurses, social workers, and so forth.

Dental health is not an isolated area of health services. Total health depends on and includes dental health. The public health nursing services which are involved directly or indirectly in the areas of dental health and dentistry are maternal and child health, school health, care and rehabilitation of the handicapped, occupational health, mental health, nutrition, communicable and chronic diseases.

The Public Health Nurse's Part

Specifically, the public health nurse has many opportunities to help make a community dental health program effective. When counseling a pregnant woman, she can emphasize the importance of adequate dental supervision and mouth hygiene throughout the maternity cycle. During these discussions she can point out to the mother an important fact to remember in feeding her children—that diet is influential in the formation of tooth structures only during the first eight years of life.

The public health nurse can frequently be influential in getting people to make dental appointments for periodic checkups and treatments. Her knowledge of community resources helps in arranging for families to use those services that the community has made available to them. Because the care of deciduous teeth and the first permanent molars is so important, the nurse has a responsibility for supplementing the dentist's instructions and interpreting his findings and recommendations to parents, teachers, and the children.

The nurse who works in the school system has all sorts of opportunities to provide and promote highly effective dental health education. She can take part in instructing children how to brush and care for their teeth as a means of improving their appearance, helping to keep the mouth clean and healthy, reducing the accumulation of tartar, and stimulating the gums. She can teach children as individuals and in groups about the possible causes and early manifestations of dental diseases, the effect of diseased teeth and gums on general health and appearance, and the need for periodic dental care. Working jointly with community agencies she can do much to further dental service in the community, particularly for the children.

The effectiveness of public health nursing's contribution to dental health has, in the past, been determined largely by the individual nurse's interest in it and her motivation to study and apply the dental science principles on her own initiative. The formal instruction in dental health that nurses have

received certainly has not prepared them to function at maximal efficiency in dental health programs, nor has it provided them with the incentive to give dental health its due in their service programs.

There are nursing schools in this country which have completely ignored dental health instruction. In some schools, the dentist on the hospital staff delivers a few lectures on dental hygiene and pathology, and in others dental school professors or local practitioners are invited to discuss dental health briefly with the students. In many schools the nursing faculty include dental health information in such courses as maternal and child health, school health, nutrition, community health, and the like. And even now there are schools which do not have a program that provides regular, periodic dental care for their students.

Dental Health Education for Nurses

An attempt to fill this gap in the nurses' academic preparation was made in 1937 at Seton Hall University School of Nursing when Dr. J. H. Wisan gave an elective 2-credit course in dental health education for graduate nurse students. During the years since then the course has grown in popularity among nurses who are preparing to work in official and voluntary public health nursing services, and particularly among school nurses employed by boards of education.

The course is described in the school catalogue as a practical one, dealing with dental public health problems, the distribution, causes, prevention, control, and treatment of oral and dental diseases, dental health education including ways of disseminating information, motivation of desirable dental health practices, and the organization of dental health programs on local, state, and national levels. The objectives of the course are developed jointly by the students and the instructor.

During the first hour each new class meets, the students complete a questionnaire which asks why they have elected the course and what they expect to get from it. Their answers help to shape and direct the course so that it may best suit their particular needs.

Consistently through the years since the course was initiated the students' answers on this questionnaire have frankly expressed their inadequate knowledge about dental health and an inability to participate satisfactorily in dental health programs. The questionnaires have indicated their desire to learn how to organize dental health programs for specific groups, how to make them successful, how best to use specific teaching aids and methods in dental health programs, what information to disseminate and how to do it best, and how to make dental health promotion effective. Students have asked for up-to-date information about such topics as fluoridation in relation to the control of dental caries, the recognition, prevention, control, and treatment of dental diseases, accidents, and malformations, and the recommended dental care for handicapped children. Generally, these students have expected that the course would give them the knowledge they needed to make them feel more secure in helping to provide or promote the dental programs of the organizations in which they were employed.

The first 30 minutes of each 2-hour class period are devoted to a critical analysis of a paper on dental public health which one of the students has read and reported on to the class. During the next hour the assigned subject material is discussed. The last half hour is set aside for informal discussion of students' specific questions and problems.

The required texts for the course are Dentistry in Public Health and Public Health and Dental Care (4,5). Field observation and conferences at dental public health facilities are arranged for each class. A guest lecturer from a state or local health department or a university is invited to talk to the group.

Since the course is given for credit there is a term paper and a midterm and final examination. On completion of the final examination, the students are asked to complete an evaluation form which they do not sign. Just as the questionnaire they answered in the first session helped in planning and directing the course taught them, so the final evaluation helps in planning the course for the next class.

These evaluations have been most gratifying to the school of nursing and the instructor of the course. The reasons for providing the course have been justified and the course objectives have been attained. The students have been enthusiastic to the point where they have recommended that the course be changed from an elective to one that is required.

As the instructor of the course, I agree with their recommendation that this type of course should be included in the curriculum of every nursing school that recognizes the promotion of total health as one of the aims for the students it graduates.

Recommended Education Programs

What can and should be done to indoctrinate nursing students with the basic principles of dental health and to interest graduate nurses in participating in programs which are aimed at reducing the community's dental health needs and problems?

All nursing schools should require and allocate at least 20 hours of instruction in dental public health. Graduate nurses should be encouraged to initiate and take courses in dental health education at university schools of nursing. The course should be required for all nurses who plan to work in public health nursing agencies and school systems. A university school of nursing which expects to set up a course in dental health education should have its faculty plan the course with the help of the state and local nursing organizations and dental societies.

Beyond the formal course in universities, public health agencies should include a dental health training period in the orientation program for all of their newly appointed nursing personnel. Staff nurses should be encouraged to participate in seminars, conferences, and workshops concerned with dental health.

The public health nurse is a member of the health team; her participation as a partner in dental health programs is welcomed and desired by the American Dental Association, the American Public Health Association, the American Association of Public Health Dentists, the American School Health Association, and the schools of dentistry.

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FLUORIDATION

(Suggested Teacher Reference Guide)*

Connecticut Advisory School Health Council

By all modern concepts of definition, as well as all modern means of detection, dentistry, for the first time, has a preventive for tooth decay -- the fluoride ion.

It is now almost 50 years since the first correlation was made between the presence of fluoride in communal water supplies of certain areas of the United States, and its terminal effect on teeth - caries prevention. During that time, it has been established overwhelmingly that the addition of a measured quantity of fluoride to public water supplies to prevent dental decay in children is not only a constructive public health measure but also that it is safe as is humanly possible to determine.

The following material is presented as resource information for use in elementary and high schools throughout the state of Connecticut. Its purpose is to provide in one compilation, factual material on the public health practice of water fluoridation.

It is understood that teachers will want and need to adapt, select, and rephrase the wording of this basic information in order to meet the level of understanding of their students. This document is limited to minimal information, but the reference bibliography will direct teachers and students to more comprehensive background materials.

The subject of fluoridation in this compilation is divided into the following subheadings: Definition; Scientific Development; Early Programs; Endorsements; Statistics; Legality; Summary; Bibliography.

Additional copies of this material for teacher use may be obtained by writing to the Connecticut State Department of Education, State Office Building, Hartford, Conn.

I. DEFINITION OF FLUORIDATION

The fluoridation of public water supplies is the adjustment of the fluoride content of a local water supply for the purpose of reducing dental decay by approximately 60 per cent.

The quantity of fluoride generally recommended is one part per million for those areas of the United States where the average annual mean temperature is approximately 50°. In warmer climates, a lesser amount would be added; in cooler climates, a higher quantity.

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*Prepared for the Connecticut State Departments of Education and of Health. Submitted for publication by Dr. Leonard F. Menczer, Public Health Dentist, Hartford Health Department, Hartford, Connecticut.

There are several kinds of fluoride compounds, typical of which are:

sodium fluoride
sodium silicofluoride
hydrofluosilicic acid

In general, fluoridation of public water supplies provides the supplementary daily ingestion of about one milligram of fluoride ion per person.

II. SCIENTIFIC DEVELOPMENT

Fluorine, a gaseous chemical element of the halogen group (symbol F, atomic number 9, atomic weight 19.00) was discovered by Carl Wilhelm Scheele, a Swedish chemist, in 1771, but not until 1886 was it isolated in its pure state by Henri Moissan.

As an element, fluorine joined the atomic table and remained in relative obscurity until the close of the first decade of the present century when it was learned that it was the cause for staining tooth enamel. Subsequently, it was discovered that small amounts of fluoride prevented tooth decay without staining.

A review of the history of water fluoridation indicates that the fluoride-decay relationship was initially established as a by-product of studies primarily concerned with the appearance of discolored teeth among certain population groups in the United States. As early as 1908, the Colorado Dental Society became interested in this problem and asked Dr. G. V. Black to study it. In 1916, in the DENTAL COSMOS, the first report describing the prevalence of this so-called mottling (staining of the tooth enamel) was published. This report re-affirmed the belief that tooth mottling and tooth decay reduction was peculiar to certain communities and was probably due to the water supply.

It was not until 1931 when chemical analytic methods of sufficient sensitivity were developed, that it was possible to determine that this "something" in the water supply was a small but significant amount of fluoride. This information led to the extensive chemical analyses of communal waters to determine their fluoride content. Colorado Springs, for example, had 2.6 parts per million; Oakley, Idaho, 8 parts per million; Bauxite, Ark., 14 parts per million. It was found that most water supplies in this country contained some fluoride, ranging from very slight traces up to 18 parts per million.

Shortly after these findings were established, fluoride and its dental-decay inhibiting effects were studied extensively by Dr. Gerald J. Cox, who is responsible for much of the early studies relating to fluoridation. Doctor Cox concluded that tooth decay could be prevented if the diet of children contained fluoride and that the greatest benefits would be obtained if the ingestion of fluoride occurred during the period of tooth development. In 1939 he recommended, because of the above conclusions, that fluoride be added to fluoride-deficient water supplies and in that way effect mass prevention of dental decay.

H. Trendley Dean and associates of the U. S. Public Health Service in a paper titled "Epidemiological Studies in the United States," presented in 1944, concluded, after an extensive study in 21 cities, that an inverse relationship exists between the prevalence of dental decay and the natural occurrence of fluorides in communal water supplies and that,

> "there is seemingly little, if any, advantage to be gained in further caries reduction by using a water higher in fluorine than one part per million and that this concentration is sufficiently low to eliminate the complicated problem of mottled enamel (pitting and staining), the advisibility of markedly reducing the dental caries incident through low fluoridation of the domestic water supply is gradually taking shape as a distinctive probability."

To summarize, scientific evidence all points to the facts that fluoride in water supplies prevent tooth decay; that where fluorides occur naturally in water, tooth decay is lessened; and finally, in fluoride deficient waters, the addition of one part of fluoride to one million parts of water (1 ppm) will achieve the same optimal results.

Scientific research on the effects of fluoridation did not stop here, but has been continued both in laboratories and through community pilot programs.

III. EARLY FLUORIDATION PROGRAMS

Following innumerable medical studies and statistical comparisons of fluoride and non-fluoride communities, it was demonstrated that no undesirable effects accompanied these dental benefits. The next logical step was to design controlled studies to determine whether the benefits observed naturally could be duplicated by raising fluoride-deficient communal waters to the one part per million fluoride level. Three such studies were initiated in 1945: Newburgh, N. Y.; Grand Rapids, Michigan; Brantford, Ontario. Similar studies were also undertaken in: Sheboygan, Wisconsin, 1946; Evanston, Illinois, 1947; Madison, Wisconsin, 1948.

The general plan for these fluoridation studies involved the initial selection of two comparable communities in an area, both with water supplies almost free of fluoride content. The water supply of one of those communities was then fluoridated. The other was not and accordingly constituted the control community for purposes of comparison. Data on dental decay prevalence in both areas were obtained by conducting dental examinations prior to the start of fluoridation in the study cities. In addition, extensive medical examinations were made prior to fluoridation and each year thereafter for the next ten years. From these and from numerous other studies, it was conclusively demonstrated:

1. that fluoridation of communal water supplies is an absolutely safe public health measure.
2. that there is a reduction between 60 and 65 per cent in tooth decay among those children born and raised in a community where the water is fluoridated.

3. that the benefits of water fluoridation acquired during the development period of the teeth are carried throughout the lifetime of the individual. Optimal benefits are received if adults continue to use fluoridated water.

4. that individuals whose teeth are already formed before fluoridation is inaugurated, acquire as much as a thirty per cent reduction in new tooth decay.

IV. ENDORSEMENTS

Without exception, every nationally accredited medical, dental and public health organization has gone on official record as approving the fluoridation of public water supplies. The earliest of these endorsements dates back as early as 1949. The following organizations and their dates of endorsement of fluoridation follow:

American Academy of Pediatrics	1953
American Assoc. for the Advancement of Science	1954
American Assoc. of Public Health Dentists	1953
American Dental Association	1950
American Medical Association	1951
American Public Health Association	1950
American Water Works Association	1949
Commission on Chronic Illness	1954
International Dental Federation	1953
Interassociation Committee on Health	1952
National Research Council	1951
Public Health Service (Dept. of Health, Education and Welfare)	1951
Association of State and Territorial Health Officers	1952

A few of these endorsements are quoted briefly below:

American Association for the Advancement of Science - "RESOLVED that the Association go on record as endorsing the fluoridation of community water supplies as a method for advancing dental public health."

"American Public Health Association reiterates its support of fluoride adjustment of public water supplies as a safe and effective method for the reduction of dental caries."

Inter-association on Health - (representing American Dental Association, American Hospital Association, American Medical Association, American Nurses Association, American Public Health Association and American Public Welfare Association) - "RESOLVED that the Inter-association Committee on Health urges the fluoridation of the fluoride deficient public water supplies of this country as rapidly as plans can be approved by the local medical, dental and health department officials and the State Departments of Health."

In addition to these national organizations being on official record for this public health measure, here in Connecticut, the state and local counterparts of these organizations have also gone on record. For example:

Connecticut State Medical Society
Connecticut State Dental Association
Connecticut Public Health Association
Connecticut State Department of Health

The Connecticut State Department of Health uses these words in recommending fluoridation:

> "The department unqualifiedly endorses and strongly recommends water fluoridation for every water supply in this state. This measure constitutes one of the major public health advances of our generation."

V. STATISTICS

In 1945, there were three communities applying fluorides to their water supply, serving approximately 200,000 people. As of January 1, 1957, because of the convincing evidence of the safety and benefits of fluoridation, 1450 communities are fluoridating, serving more than 30,700,000 Americans.

It is a fact that today more than one-fourth of the total population of the United States receiving water from a communal source are receiving fluoridated water. The following table indicates the growth of fluoridation projects in the United States by year since 1945:

Year	No. of Communities Adopting Fluoridation Each Year
1945	3
1946	7
1947	4
1948	7
1949	19
1950	39
1951	225
1952	347
1953	192
1954	183
1955	112
1956	312
TOTAL	1,450

Of these 1,450 communities, 7 of the 9 largest cities in the United States are fluoridating and 22 of the largest 50. These are:

Chicago	Indianapolis
Philadelphia	Denver
Baltimore	Louisville
Cleveland	Rochester
Saint Louis	Saint Paul
Washington, D. C.	Fort Worth
San Francisco	Providence
Pittsburgh	Miami
Milwaukee	Oklahoma City
Buffalo	Richmond
Minneapolis	Norfolk

VI. LEGALITY OF FLUORIDATION

As early as 1952, the subject of legality as it relates to this public health measure was thoroughly studied by the National Institute of Municipal Law Officers. This organization was formed in 1935 and its membership is limited to municipal corporations. Approximately 3,000 attorneys participate in the National Institute of Municipal Law Officers.

Following a thorough review of precedent established by other public health measures as well as the merits of fluoridation, the National Institute of Municipal Law Officers in 1952 stated:

> "Fluoridation of public water supplies is an effective, safe, economical, and constitutional public health measure for reducing the incidence of dental caries.
>
> "Fluoridation is not an unconstitutional invasion of the right of freedom of religion.
>
> "Fluoridation is a constitutional, permissable exercise of the municipal civil government.
>
> "Fluoridation to the recommended concentration will not create municipal tort liability."

Legality and the constitutionality of fluoridation has been tested in United States Courts as early as 1952. Since that time, a number of cases have been handed down by local and state courts as well as by the United States Supreme Court. In all instances, the court's decision upheld the particular fluoridation program adopted by local officials. From a survey conducted in late 1956, it was found that in 19 U. S. communities, water fluoridation had been contested in the courts by individual citizens. In every instance, the final court action has been to uphold the legality of fluoridation. Four cases were denied review by the U. S. Supreme Court and three cases were withdrawn.

The following are excerpts of court decisions as they relate to fluoridation:

"The police power should be given the broadest application and this power is increasingly exercised in keeping with advances made in the science of medicine and sanitation in recent years. Accordingly, courts are reluctant to place limits on what may be done in the interest of the health of the community ...."

Judge Dean Sherry
Superior Court of San Diego County
April, 1952

"We must rely on scientists, doctors, and dentists in technical affairs of this kind, and when we have an honest opinion given after a careful study, I think it is entitled to great weight and should be adopted, so I find from the evidence that there is nothing in this proposed program that would be deleterious to the health of the people of Baltimore City, and I do not find, from the evidence, that the addition of sodium fluoride to the water supply, is a calculated risk of any kind."

Circuit Court
Baltimore 1953

"Fluoridation is a public health measure bearing a real, substantial, and reasonable relation to the health of the city."

Judge Ronald A. Drechsler
Circuit Court
Milwaukee County

VII. SUMMARY

The idea that fluorides are foreign to water supplies is a misconception. It has been demonstrated that trace quantities of fluorides exist in practically every water supply in the United States and that optimum quantities (between 0.7 parts per million and 1.5 parts per million) have existed in as many as 1,191 communities in the United States, serving more than 4,200,000 persons for as long as man can determine. The application of fluorides to fluoride-deficient water supplies is merely a demonstration of man's control of his environment and thereby provides a deficient element necessary for dental health. Just as has been demonstrated that iodine is a necessary element for the proper functioning of the thyroid gland, fluoride is an element required for dental health. Fluorides also exist naturally in quantities as high as 18 times the recommended amount with no harmful effects except for discoloring or staining of tooth enamel. Nature, in fact, has provided its own proving ground for this public health measure and from nature's proving ground, man has been able to undertake exhaustive detailed studies to prove its safety and effectiveness.

Fluoridation is comparable to the other public health advances such as immunization, chlorination and pasteurization. It is a preventive against an all-too-common disease, dental decay, and does not in any way constitute treatment.

Analytical studies of the public water supplies of Connecticut reveal that almost all are deficient in the optimum amount of fluoride ion. Because of this fact, fluoridation of these waters becomes a public health responsibility and must be accomplished with the cooperation of private and public agencies. This responsibility has been accepted because it is well established that fluoridation of the public water supplies is safe, effective, and legal.

STATEMENT TO THE SCHOOLS OF CONNECTICUT REGARDING FLUORIDATION

1. Following innumerable surveys in Connecticut, it has been found that tooth decay and other dental defects have the highest incidence among the physical defects found in our school children. Its extent, wide-spread neglect, cost of correction and impact on general health make it a true public health problem demanding a preventive approach.

2. Water fluoridation at the level of one part per million, after approximately fifty years of extensive research, has been established as a procedure which offers a sixty per cent reduction in new dental decay for children. Adults who consume such water will also benefit appreciably.

3. An impressive body of scientific information attests to the achievement of these substantial dental benefits without harm to any of the body systems or any existing industrial process using fluoridated water. There is no known health measure, the safety of which has been subjected to as complete or more extensive investigation prior to adoption, as has fluoridation.

4. The evaluation of all known techniques for prevention of tooth decay leads to the conclusion that water fluoridation combines maximum benefits and practicality. In fact, so convincing are the studies that have been made on this public health measure that today more than one-fourth of the population in the United States, served by public water supplies, is now receiving fluoridated water. As of January 1, 1957, there were 30,700,000 persons in 1,450 communities receiving the benefits of fluoridation.

   In view of these findings and conclusions as well as the unqualified endorsement and recommendation of water fluoridation by the Connecticut State Department of Health, the Connecticut Advisory School Health Council urges that appropriate action be taken by Boards of Education and school superintendents throughout Connecticut:

   A. To call to the attention of teachers and students the value of this important public health measure by including such information in the school health curriculum.

   B. To work with community agencies, (tax supported and voluntary) toward promotion of public information on the values of water fluoridation. The actual achievement of fluoridation programs would still be the responsibility of agencies other than the schools.

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FLUORIDE DOMESTIC WATER AND PERIODONTAL DISEASE*

A. L. Russell**

Other reports in this series describe some basic epidemiological characteristics of periodontal disease in urban[1] and in rural[2] populations, and explore an unknown social factor, indicated by levels of education, which is associated with the severity of disease once present.[3] This paper summarizes the evidence bearing upon the relation of periodontal disease to use of a fluoride-bearing domestic water, including all pertinent data collected by us through the summer of 1956. The data are based on examinations of nearly 20 thousand persons of both sexes, ranging in age from 7 to 78 years.

Though many opinions have been expressed in this area, very little epidemiological evidence has been offered. Brown, Kohli, MacDonald, and McLaren surveyed children aged 6-14 years in three Canadian cities, using the P-M-A index of gingivitis. The domestic waters in these cities carried none, 1.0, and 1.3 parts per million of fluorides (F), respectively. The least gingivitis was found in the community with 1.0 parts per million of fluoride; rather more gingivitis was found in the fluoride-free community; and substantially more in the community with 1.3 parts per million of fluoride.[4] In ten-year summaries of the fluoridation study at Newburgh, New York, Ast and his co-workers have reported that there was slightly but significantly more gingivitis in children of Kingston, the control city, than in children of Newburgh who had used a fluoridated water for from seven to ten years.[5,6] This examination was carried out by the author, and its findings will be presented here in greater detail.

Method

If any relation between the use of a fluoride domestic water and health or disease in periodontal tissues exists in fact, it should readily be demonstrable by the methods which have established the inhibitory effect of fluoride waters upon dental caries. The most common method has contrasted a fluoride-free population with others using fluoride-bearing domestic waters with varying fluoride concentrations. Additional evidence has resulted from contrasts of the status of natives in a fluoride community with the status of migrant persons, who have used the same water for a shorter period of time. Both methods are applied to periodontal disease in the present report.

The examination and scoring methods previously described[7] were used throughout this series. All of the examinations were performed by the author, or by observers directly calibrated with him.

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* Presented before the Dental Health and School Health Sections of the American Public Health Association at the Eighty-fourth Annual Meeting in Atlantic City, N. J., November 15, 1956.

**National Institute of Dental Research, National Institutes of Health, Public Health Service, U. S. Department of Health, Education and Welfare, Bethesda, Md.

Fluoride vs. Non-Fluoride Populations

Three studies have been carried out by us which contrast the periodontal status of residents of fluoride and non-fluoride communities. They are presented here in order of the ages of the persons examined and of the concentrations of fluoride in the three domestic waters.

Newburgh-Kingston--The domestic water of Newburgh, New York, was fluoridated early in the summer of 1945 in a study project conducted by Ast and his co-workers in the State of New York Department of Health. The water in nearby Kingston was maintained fluoride-free as a control. Through the courtesy of Ast and his group, about 600 children aged 7-14 years were examined for periodontal disease, in each of the cities, in April of 1955. The results of this examination are summarized in Table 1.

The proportions of children free from overt signs of disease were higher throughout the age range in children of Newburgh, the fluoride city, than in children of Kingston, the control. For the whole groups, the difference between the proportions is significant.* Mean population scores, which reflect both the prevalence and severity of disease, were uniformly higher in Kingston than in Newburgh; for the whole groups the difference between the scores is on the borderline of significance at the P = .05 level. This difference is due wholly to the higher prevalence of disease in Kingston. When present, disease was of about equal severity in the two communities. One child with marginal periodontitis which had progressed to the stage of frank pocket formation was found in each city.

Colorado Springs-Boulder--Native adults of Colorado Springs, Colorado (with domestic water carrying about 2.5 parts per million of fluoride) and of Boulder, Colorado (with a domestic water essentially fluoride-free) were examined in the fall of 1950. Their dental caries status has been reported previously.[8] Data were limited to persons aged 20-44 years, because the fluoride content of Boulder water prior to 1906 could not be established. Periodontal findings for these people are summarized in Table 2.

Periodontal disease was more prevalent in life-time residents of Boulder, using a fluoride-free water, than in life-time residents of Colorado Springs, who had always used a water containing about 2.5 parts per million of fluoride. There were significantly fewer Boulder natives free of disease, and significantly more Boulder natives with advanced disease. These differences are reflected in the relative scores. Once initiated, disease was equally severe in the two communities; mean scores for the 89 persons in Boulder and for the 179 persons in Colorado Springs who exhibited positive signs of disease were identical at 1.28. As in the Newburgh-Kingston study, the observed differences were due wholly to the higher prevalence of disease in the community using the fluoride-free water.

These findings are based upon direct observation by the examiner. While weaker as evidence, indirect findings based upon histories supplied by examinees are consistent with the direct findings. On the basis of these histories, slightly more teeth per person had been extracted because of

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*When not stated, the level of significance used is the P = .01 level.

periodontal disease in Boulder than in Colorado Springs.[8] Among persons wholly edentulous, three in Colorado Springs (0.8 per cent of the population examined) and four in Boulder (2.8 per cent of the population examined) testified that periodontal disease had been the major reason why their teeth had been extracted.

Bartlett-Cameron--Smaller groups of older adults were examined in 1953 in Bartlett and in Cameron, Texas. Until a defluoridation plant was installed a short time before this examination, Bartlett's domestic water had contained about 8.0 parts per million of fluoride. The fluoride content of Cameron's water was about 0.4 parts per million.

The objective in 1953 was the re-examination of a group of adults who had received detailed physical examinations ten years previously. Of these original subjects, 76 were re-examined in Bartlett and 80 in Cameron. Very few were natives of either city. The average length of residence had been 37 years in Bartlett, and 38 years in Cameron. No differences in periodontal disease, on the basis of clinical and X-ray examination, had been seen in these people in 1943.[9] In 1953 there were no significant differences between the groups, as estimated by the P-M-A index and by the degree of alveolar bone resorption disclosed by X-ray.[10]

The relative status of these two groups, as scored by the periodontal index, is shown in Table 3. Because of the small numbers of dentulous persons and the wide age range (25 through 78 years) findings are shown for the total groups.

Nearly all of the persons seen in both cities exhibited some sign of disease. Differences seen were small, and favored the Bartlett group, which had used the water containing about 8.0 parts per million of fluoride. Unlike the two contrasts previously cited there was a difference in severity of disease; periodontal destruction was appreciably more advanced in the low-fluoride group. There were about twice as many persons in Cameron as in Bartlett (11, or 13.8 per cent of the group in Cameron against 5, or 6.6 per cent of the group in Bartlett) in whom tissue destruction was so advanced that full-mouth extractions were indicated.

Indirect evidence was opposite in direction. About twice as many of the edentulous persons in Bartlett as in Cameron (21, or 26.6 per cent of the whole group in Bartlett, against 9, or 11.3 per cent of the whole group at Cameron) believed that periodontal disease had been the primary reason for loss of their teeth. If the numbers requiring full-mouth extractions are combined with these, tooth mortality findings are about balanced between the two groups, and group scores for the remaining persons are about the same.

This supports the previous conclusion, based on other methods of estimation, that "the periodontal health of the Bartlett and Cameron subjects was approximately the same."[10]

Summary--In each of these contrasts, the more favorable condition of the periodontal tissues was observed in the fluoride community. In the two adult groups indirect evidence was opposite in direction. The three groups included persons aged 7 through 78 years. Two of the groups had used a domestic water

containing fluorides considered to be excessive in amount—2.5 and 8.0 parts per million, respectively. The fluoride water had been consumed for from seven years, in children, to as long as 44 years, in adults. If use of a fluoride water has any adverse effect upon the health of periodontal tissues, it is quite likely that this effect would have been revealed clearly in one or all of these studies. The fact that no adverse effect is evident is wholly incompatible with any hypothesis that use of a fluoride-bearing water is harmful to the periodontal tissues of children or of adults.

On the other hand, the slight difference in favor of the fluoride communities are too weak for acceptance as evidence that use of a fluoride water is beneficial to periodontal tissues. With the exception of Boulder, the findings for these groups are very similar in all details to those for the total population of white urban residents so far examined.[1] In this total group most of the other persons aged 20 years or older were residents of Baltimore, using a fluoride-free water at the time of examination.

Natives vs. Migrants in Fluoride Communities

Marked differences in caries inhibition have been demonstrated by within-group analyses of residents of fluoride areas. Those children who had used the fluoride water since birth have shown significantly lower caries scores than those children who had moved into the community at some time after birth and had, hence, used the same water for a shorter period of time.[11] Accordingly, a similar analysis was applied to the periodontal data gathered by us. The examinations of about 18,000 children, in communities with domestic water supplies that had contained about 1.0 parts per million of fluorides for varying lengths of time, are summarized in Table 4.

If use of a fluoride domestic water is actually harmful to periodontal tissues, the data of Table 4 should reveal a trend opposite in direction to that seen in the inhibition of dental caries; i. e., the longer the fluoride water has been in use, the more migrant children should excel native children in periodontal health. When the duration of fluoride consumption by natives is plotted against the differences in scores* between native and migrant children, the result is as shown in Figure 1.

Simple inspection of this figure shows that no adverse trend; i. e., a worsening of the relative periodontal status of native children associated with the length of time they have consumed a fluoride-bearing domestic water, is apparent. On analysis there is a weak but valid negative correlation indicating

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*It has been observed that periodontal scores in children are elevated if a group is examined coincident with the peak, or early on the declining slope, of an outbreak of an upper respiratory infection, probably Influenza A[1] or B. This was generally the case in the schools examined in 1953, and was observed sporadically in other years. Comparisons between total scores are misleading unless corrections for this factor are made. But differences between scores within groups are virtually independent of this factor, since the outbreak tends to affect native and migrant children to an equivalent degree.

that, in general, the greater their advantage in the consumption of water-borne fluoride, the more native children tend to excel migrant children in the health of their periodontal tissues.

As in the fluoride-nonfluoride contrasts, this finding cannot be accepted as evidence that use of a fluoride domestic water enhances the health of periodontal tissues. These within-community differences and trends may be associated with the social status of the groups involved as this association has been observed elsewhere.[3] But the finding is clearly incompatible with any hypothesis that use of a fluoride domestic water is injurious to periodontal health.

This result cannot be ascribed to examiner bias, since the residence history of none of the children was known to the observer at the time of examination.

Summary and Conclusions

1. The periodontal status of residents of three fluoride communities has been compared with the periodontal status of residents of three comparable low- or non-fluoride communities. Ages of the persons studied ranged from 7 to 78 years. The domestic water supplies of the fluoride communities carried about 1.0, about 2.5, and about 8.0 parts per million of fluorides, respectively. Fluoride subjects had used the domestic water for from 7 to 44 years. Indirect evidence in two adult groups was opposite in direction. In each case the fluoride group exhibited the more favorable periodontal condition on direct examination.

2. Native school children in a series of communities, each with about 1.0 parts per million of fluorides in its domestic water, were compared with migrant children in the same communities. There was a weak tendency for the periodontal health of native children to improve, relative to that of migrants, as their advantage in water-borne fluoride consumption increased.

3. Most of the differences were slight. They are not adequate to support a hypothesis that use of a fluoride domestic water results in improved health of periodontal tissues.

4. The findings are wholly incompatible with any hypothesis that the periodontal tissues of children or of adults are harmed by use of a fluoride-bearing domestic water.

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Table 1.

RELATIVE PREVALENCE AND SEVERITY OF GINGIVAL DISEASE IN CHILDREN OF NEWBURGH AND OF KINGSTON, NEW YORK (March, 1955)

Age Group	Mean Age, Years	Number Examined	Per Cent Negative	Mean Score
Newburgh (1.0 ppm F since 1945)				
7-9	8.9	238	91.6	.02
10-12	11.3	352	92.0	.03
13-14	13.6	29	96.6	.03
All ages:	10.5	619	92.1	.02
Kingston (fluoride-free)				
7-9	9.0	246	84.1	.03
10-12	11.3	328	84.8	.04
13-14	13.6	18	88.9	.08
All ages:	10.4	592	84.6	.04

Table 2.

RELATIVE PREVALENCE AND SEVERITY OF PERIODONTAL DISEASE IN NATIVE RESIDENTS OF BOULDER AND OF COLORADO SPRINGS, COLORADO (1950)

Age Group	Mean Age	Number Examined	Per Cent Negative	Per Cent With Pockets	Mean Score	Additional Per Cent Edentulous*
Boulder (fluoride-free)						
20-24	22.4	51	52.9	7.8	.47	0.0
25-29	27.1	41	29.3	19.5	.81	0.0
30-34	32.0	27	44.4	22.2	.66	6.9
35-44	39.3	25	16.0	56.0	1.54	26.5
All Ages:	28.5	144	38.2	22.2	.79	7.1
Colorado Springs (2.5 ppm F)						
20-24	22.7	72	58.3	4.2	.33	0.0
25-29	27.5	101	55.4	4.0	.39	0.0
30-34	32.2	82	54.9	15.9	.66	0.0
35-44	39.6	124	46.0	23.4	.91	4.6
All Ages:	31.6	379	52.8	12.9	.60	1.6

*not included in totals listed under "numbers examined."

Table 3.

RELATIVE PREVALENCE AND SEVERITY OF PERIODONTAL DISEASE IN RESIDENTS OF BARTLETT, TEXAS (WITH AN AVERAGE OF 37 YEARS' USE OF A DOMESTIC WATER CONTAINING ABOUT 8.0 ppm F) AND OF CAMERON, TEXAS (WITH AN AVERAGE OF 38 YEARS' USE OF A DOMESTIC WATER CONTAINING ABOUT 0.4 ppm F).

City	Number Examined	Mean Age	Per Cent With Teeth	Per Cent Negative	Per Cent With Pockets	Mean Score	Per Cent Edentulous
Bartlett	76	54.3	59.2	4.4	62.2	1.70	40.8
Cameron	80	53.9	80.0	3.1	68.8	2.01	20.0

Table 4.

PERIODONTAL SCORES OF NATIVE AND MIGRANT CHILDREN IN A SERIES OF COMMUNITIES WITH DOMESTIC WATERS CONTAINING ABOUT 1.0 PARTS PER MILLION OF FLUORIDES, 1952-1956.

Group	Year of Examination	Years F Usage, Natives	Natives Number	Natives Mean Age	Natives Mean Score	Migrants Number	Migrants Mean Age	Migrants Mean Score	Difference (Native score minus Migrant)
Montgomery County, Maryland (A)	1952	0.0	307	8.2	.01	195	8.6	.01	—
	1956	4.0	497	8.3	.02	443	8.5	.02	—
Montgomery County, Maryland (B)	1952	0.0	237	13.8	.06	233	13.9	.04	± .02
	1953	1.0	250	13.9	.19	230	13.6	.16	± .03
	1954	2.0	233	13.7	.10	244	13.7	.08	± .02
	1955	3.0	221	13.4	.04	186	13.5	.04	—
	1956	4.0	176	13.5	.05	197	13.5	.06	- .01
Prince Georges Co., Maryland (C)	1952	0.1	874	9.1	.03	435	8.9	.02	± .01
	1956	4.1	778	8.8	.03	680	8.9	.02	± .01
Prince Georges Co., Maryland (D)	1952	0.1	303	13.9	.06	171	13.8	.04	± .02
	1953	1.1	201	14.0	.21	161	14.1	.17	± .04
	1954	2.1	238	13.6	.05	198	13.7	.07	- .02
	1955	3.1	322	13.6	.08	306	13.6	.06	± .02
	1956	4.1	499	13.6	.11	414	13.7	.08	± .03
Prince Georges Co., Maryland (E)	1953	1.2	449	14.0	.36	173	14.1	.29	± .07
	1954	2.2	441	13.9	.26	191	13.9	.26	—
	1955	3.2	315	14.1	.24	143	14.2	.19	± .05
	1956	4.2	423	13.9	.18	191	13.9	.18	—
Muskegon, Michigan (F)	1952	1.3	147	15.5	.06	95	15.4	.11	- .05
	1953	2.3	158	14.1	.17	96	14.7	.14	± .03
	1954	3.3	155	15.1	.04	106	15.8	.05	- .01
Prince Georges Co., Maryland (G)	1954	2.3	495	16.9	.30	258	16.9	.26	± .04
Muskegon, Michigan (H)	1955	4.3	645	9.5	.04	205	10.3	.08	- .04*

Table 4 (continued)

Grand Rapids, Mich. white (I)	1952	7.8	288	14.4	.07	147	14.8	.05	+ .02
	1953	8.8	296	13.7	.10	139	14.2	.13	- .03
	1954	9.8	595	14.5	.05	431	14.7	.06	- .01
	1955	10.8	627	14.4	.07	501	14.7	.09	- .02
Grand Rapids, Mich. negro (J)	1952-5	8-11	110	14.6	.14	279	14.8	.11	+ .03
Aurora, Illinois (K)	1953	13.5	360	13.5	.09	207	13.5	.11	- .02

*difference significant at the P = .01 level

E D I T O R I A L S

SECOND-CLASS MEMBERS

In his Presidential Message Frank Erlenbach recommended that the American Association of Public Health Dentists review its membership requirements.

It is our understanding that there are presently three categories of membership in the AAPHD--active, associate, and honorary. In reviewing the requirements for active and associate membership, one finds that only holders of a DDS or DMD degree, who are actively engaged in and whose major interest is dental public health, may become active members; whereas anyone "actively engaged in Programming, Public Health Education, or Research" or holding a DDS or DMD degree and actively interested in dental public health may become an associate member.

These requirements sort of make "second-class citizens" of our worthy co-workers, the dental hygienists, the dental health educators, and others, "who are actively engaged in and whose major interest is dental public health."

True, the title of this organization is "The American Association of Public Health Dentists," but is it not time that the name be changed to "The American Dental Public Health Association" and the active membership opened up to all dental public health workers? After all, we dentists frequently point the finger of scorn at our medical colleagues because of their "god-complexes." When we become restrictive in our association, are we not guilty, also?

Our co-workers in dental public health, the dental hygienist, the dental health educator, and others, have earned the right to sit side by side with us in our dental public health deliberations, to have a full vote, to hold office, and to have all privileges of full membership. No longer should they be "second-class citizens."

D. F. S.

TAKE ONE PINCH OF FLUORINE*

The practice of fluoridating drinking water has received a Presidential blessing. At a recent press conference President Eisenhower told reporters he drinks Washington's treated water and finds it potable. His remarks highlight a growing public interest in fluoridation and, in some areas, a burgeoning

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*From the Cambridge, Maryland, Daily Banner, March 11, 1957.

suspicion and resentment toward the practice of treating community water supplies. In the face of endorsements from dental and medical associations, there remains a stubborn minority which views fluoridation as an effort to poison the populace.

All this sound and fury must be a source of genuine amusement to residents of Dorchester County. The Creator has seen fit to distribute fluorine in this county with an uneven hand. Upper county areas have very little or none of the chemical. Cambridge has what science thinks is the optimum for good teeth, while such lower Dorchester districts as Wingate have heavy concentrations. To our knowledge our people have been drinking this hopped-up water for years with no ill effects and with no suspicion that they are the victims of any Divine plot.

A Spokane, Washington, newspaper recently wrote a scathing editorial criticizing the Defense Department for attempting to add fluorine to the water supply of a Western military camp. Where is the democracy in this? roared the Spokane editorial writer. Who will speak up for the minority which may be forced to drink this water against its will?

Chemistry students know that fluorine in heavy concentrations is powerful enough to etch glass. The ingredients in common table salt can burn and gas a man fatally. Similarly, editorials and prejudices in too strong doses can distort and disguise the facts. We personally like Cambridge's drinking water, fluorine and all. It tastes especially good after sampling some of the well water in the vicinity of the Nanticoke River.

We can't work up much enthusiasm for the view that the Creator played us an underhanded, undemocratic trick by dribbling a pinch of fluorine into the water supply.

EDITOR'S NOTE: Cambridge is (1) a community in which for a known 18 years the water supply has had a natural fluoride content of 1.0 ppm and (2) where currently a dental care time study is being conducted by the U. S. P. H. Service personnel for comparison with the findings of similar studies in Woonsocket, R. I., and Richmond, Indiana.

LEST WE FORGET

Both the very human tendency to forget and the possibility that newcomers to the field of dental public health do not know them prompts the following reminder of the objective and policies of the American Association of Public Health Dentists.

CONSTITUTION

Object

The objects of this Association are: to promote dental public health, maintain the ideals of organized dentistry in all dental public health projects, and afford an opportunity for constructive discussion of the administrative problems of dental health programs.

Policies

The policies of the Association are: (1) promotion of dental public health, (2) maintenance of a closely knit affiliation with the American Dental Association and cooperation with that body in matters pertaining to public health and socio-economics, (3) establishment of a like relationship between this Association and the American Public Health Association, (4) fostering improvement in the training of personnel of dental public health programs, and (5) inauguration of policies that will aid in proper administration of state, county, municipal and federal dental public health projects.

With a terse directness - indeed, with an almost over-simplification - these statements put forth the underlying principles of our Association's genesis and continued existence. That adherence has been given them is not to be questioned. Nor is it to be doubted that they will be followed in the future. But being reminded of them may prevent those disasters that can result from losing sight of the thought and consideration that were the premises of their original drafting.

N O T E S and N E W S

CORRESPONDENCE

Dr. Richard C. Leonard, Editor
Bulletin, American Association of Public Health Dentists
Maryland Department of Health
Baltimore, Maryland

Dear Dick:

I apologize profusely for overlooking the last dead line and for almost missing this one. I suppose you've gotten tired of sending out reminders and I had become dependent on them. I have no excuse, but I do ask your forgiveness.*

In any event, here are the news notes and items for that portion of the West as I have been able to glean them:

Texas

John Stone, formerly of the Michigan Department of Health, is now ensconced on his job as Director of Dental Health with the Texas State Department of Health, assuming his duties February 1. John, his wife, and five children finally found a house in Austin large enough. He reports that Mrs. Frank Bertram and her son are continuing to make Austin their home.

The Houston City Health Department Dental Division under Marvin Mergele is beginning a research study on topical stannous fluoride. Joe Muhler was down from Indiana to kick it off.

New Mexico

Quite a few celebrated dental public health visitors either have been or will be out New Mexico way.

Phil Blackerby of the Kellogg Foundation spent a day in Albuquerque on his way through to Los Angeles in February. Phil conferred with University of New Mexico and New Mexico State Dental Society officials about the Continuing Education Program for New Mexico Dentists which the Kellogg Foundation is subsidizing. He happened into town on the same day that the Postgraduate Dentistry Seminar was on and watched Nate Friedman of Southern California lecture on periodontics and Roy Doty of the American Dental Association lecture on new drugs. (Seventy of New Mexico's 200 dentists turned out for the Seminar.)

*Granted

John Stone of Texas, Bob Downs of Colorado, and Frank Walters of the Public Health Service Regional Office were in Santa Fe in March for a one-day American Public Health Association Committee on Dental Public Health Practice meeting. The group decided to try to develop a dental public health practice manual to serve as a guide for neophyte public health dentists, health officers, and dental societies. The manual will try to answer the question, "In general, what should public health dentists be doing and how?" Subcommittees to develop the manual were appointed for some 12 problem areas.

Wes Young of Idaho was also in Albuquerque in March on his way from Denver to Phoenix and Los Angeles in his capacity as dental health consultant to WICHE on dental manpower needs of the West. He met with officers of the New Mexico State Dental Society to discuss the recently published "Demand for Dentists in New Mexico," a dental manpower study conducted by the Bureau of Business Research at the University of New Mexico.

Bill Elsasser of San Francisco, formerly a co-worker of Jack Pelton's on the DFI, presented a clinic to the Santa Fe District Dental Society in January.

John Knutson will be in New Mexico in May with the American Public Health Association team to attend the New Mexico Public Health Association meeting. The team will also visit several other Western states.

New Mexico reports that 92% of its population served by community water supplies is now drinking at least optimum amounts of fluoride in its water supplies.

The first New Mexico Working Conference on Dental Health will be held September 12, 13, and 14 at a guest ranch in the Santa Fe area.

Four New Mexico dentists are attending two-week refresher courses in dentistry for children at the University of Michigan this year. They are sponsored by the New Mexico State Dental Society, the New Mexico Department of Public Health, and the Kellogg Foundation.

A New Mexico Unit of the American Society of Dentistry for Children has been formed recently. Their first project will be to tackle the problem of dental care for handicapped children.

<u>Nebraska</u>

Hubert J. Wegener assumed the post of Omaha-Douglas County Dental Health Director in January. He was graduated with an MPH from Michigan in 1956 and served as a regional director in Georgia until his Omaha appointment.

(Signed) Dave Striffler

March 29, 1957

Richard C. Leonard, D.D.S., Chief
Division of Dental Health
State Department of Health
2411 North Charles Street
Baltimore, Maryland

Dear Dick:

Regret to inform you that Allen Gruebbel has suffered a coronary occlusion. He is on bed rest with absolute quiet -- no letters, no phone calls.

Yours very sincerely,

C. E. Presnell, D.D.S.
Director, Bureau of Dental Health

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GOOD POSTSCRIPT

Just prior to sending copy to the Publisher direct inquiry was made of Allen Gruebbel as to the foregoing situation and from his reply the following is quoted:

"It seems the guy was right who said that burning the candle at both ends is no good. Either that or something else put me to bed for almost two months with a 'broken' heart. The wound was healed apparently and, as John Knutson said, I am now eligible for the Presidency of the U. S.

I am back on the job, a few hours a day. I feel better and <u>some</u> say I look better. Less weight, the usual diet and much sleep - that's for me."

Other portions of Allen's letter with the above splendid news, are of such esoteric character as to preclude publication herein. Suffice it to say that Allen goes the elephant one better. He remembers things he never knew.

American Dental Association
222 East Superior Street
Chicago 11, Illinois

February 6, 1957

Dr. Polly Ayers
American Association of Public Health Dentists
Jefferson County Board of Health
P. O. Box 2591
Birmingham, Alabama

Dear Dr. Ayers:

This letter is to notify you officially that the American Association of Public Health Dentists has been assigned to the Columbus Hotel in Miami for its annual meeting November 2.

You may deal directly with the management of the Columbus Hotel in making your arrangements for the use of public meeting space and social events.

The Housing Bureau will open in Miami Beach on May 1 and I will see that a supply of application forms are sent to you in advance so that you may distribute them to your officers.

Let me know if there is anything further I can do in connection with your annual session.

My kindest regards,

Sincerely,

L. M. Cruttenden, D.D.S.
Assistant Secretary

LMC:MP
cc: Dr. Arthur W. Kellner
Mr. Thomas F. Smith
Dr. F. H. DeCamp

STUPENDOUS

In its sheer size, in its scope of coverage, in its excellence of format and in the amount of painstaking effort that went into its development and editing, S T U P E N D O U S is a still inadequate adjective to describe "The Practice of Dental Public Health" recently published by the University of

Michigan, School of Public Health. Its nearly 200 pages comprise as complete a delineation of today's concept of dental public health as is apt to be made available for a long, long time.

That everyone will be in full agreement with all of this text is not, of course, to be expected. But even disagreement adds to the value of this book as a reference source, demanding as it does that differences of opinions be validated by as thorough consideration, by as broad bibliographical review and by as studious approach as served as a foundation for this encyclopaedic portrayal of dental public health.

The book was authored, in a sense, by more than fifty persons, participants in the "Fourth Workshop on Dental Public Health" held at the University of Michigan, School of Public Health, April 2-6, 1956. It constitutes the "Proceedings" of that Workshop which was directed by that master director, Kenneth A. Easlick. Dr. Easlick likewise rates high praise for his editing of voluminous material emanating from the five day grueling task of delving into myriad aspects of a carefully developed preliminary outline of specific assignments.

That the site of the Workshop resulted in a predominance of Michigan men among the participants is natural. That this predominance unduly influenced the conclusions reached does not follow. Some of the group represented the far corners of the nation and were, to say the least, vociferously articulate. Hence, no one school of thought could have, even had it been considered, (and we do not think it was) dominated the thinking or the resulting determinations.

Aside from the reports of the five groups assigned consideration of specific facets of dental public health, the book includes thirteen (certainly, not unluckily) formal papers presented to the Workshop participants and guests. The high calibre of these papers attests both the merit of the Workshop and of this volume that records them for future reference.

It would be remiss to fail to reiterate the excellence rendered by Dr. Easlick in his task of editing. No one will be surprised by his accomplishment, but the Workshop participants will be awed by it.

The book is available from "The University of Michigan Publications Distribution Service" 412 Maynard Street, Ann Arbor, Michigan for $3.00 per copy. That for this modest sum one may secure this truly valuable addition to a dental public health library is amazing! It should have the widest possible sale.

RE SEVERANCE ET AL

Numerous state dental directors have been recipients of correspondence from one Rollin M. Severance of Saginaw, Michigan on the subject of fluoridating communities. His interest in and his attitude toward fluoridation is not

always made clear in his letters, some of which avoid any expression of his opinion regarding the subject. Indeed, some interpretation of his inquiry might lead to the belief that he definitely endorses fluoridation or, at least, is seeking pro-fluoridation supportive data.

To the contrary, Severance is very much of an anti-fluoridationist. A letter of his submitted by Olin Hoffman, Washington State Dental Director, states that his (Severance) thirst for fluoridation data is premised on his desire to "benefit" various and sundry individuals by advising them how to "avoid.....places where this substance is added to the water supply". Another Severance letter, addressed to the writer of this item, blandly forgets to state his attitude on fluoridation and only queries as to the accuracy of previously secured dated on what new communities are fluoridating their water supplies. This second letter was answered with the suggestion that a statement on the purpose of his inquiry would be appreciated. No reply has been received!!

Fred Wertheimer has a raft of data on Severance's background. Apparently the securing of fluoridation data is followed by a flood of anti-F material in the listed communities. He is obviously, enlisting the unwitting aid of pro-fluoridationists in his "anti" campaign. Ethical ?

THE RESPONSIBILITIES OF THE MEDICAL PROFESSION IN THE USE OF X-RAYS AND OTHER IONIZING RADIATION

Statement by the United Nations Scientific Committee on the Effects of Atomic Radiation

1. The United Nations General Assembly, being aware of the problems in public health that are created by the development of atomic energy, established a Scientific Committee on the Effects of Atomic Radiation. This Committee has considered that one of its most urgent tasks was to collect as much information as possible on the amount of radiation to which man is exposed today, and on the effects of this radiation. Since it has become evident that radiation due to diagnostic radiology and to radio-therapy constitutes a substantial proportion of the total radiation received by the human race, the Committee considers it desirable to draw attention to information that has been obtained on this subject.

2. Modern medicine has contributed to the control of many diseases and has substantially prolonged the span of human life. These results have depended in part on the use of radiation in the detection, diagnosis and treatment of disease. There are, however, few examples of scientific progress that are not attended by some disadvantages, however slight. It is desirable therefore to review objectively the possible present or future consequences of increased irradiation of populations which result from these medical applications of radiation.

3. It is now accepted that the irradiation of human beings, and particularly of their germinal tissues, has certain undesirable effects. While many of the somatic effects of radiation may be reversible, germinal irradiation normally has an irreversible and therefore cumulative effect. Any irradiation of the germinal tissues, however slight, thus involves genetic damage which may be small but is nevertheless real. For somatic effects there may however be thresholds for any irreversible effects, although if so these thresholds may well be low.

4. The information so far available indicates that the human race is subjected to natural radiation,[1] as well as to artificial radiation due to its medical applications, to atomic industry and its effluents and to the radioactive fall-out from nuclear explosions. The Committee is aware of the potential hazards that such radiation involves, and it is collecting and examining information on these subjects.

5. The amount of radiation received by the population for medical purposes is now, in certain countries, the main source of artificial radiation and is probably about equal to that from all natural sources. Moreover, since it is given on medical advice, the medical profession exercises responsibility in its use.

6. The Committee appreciates fully the importance and value of the correct medical use of radiation, both in the diagnosis of a large number of conditions, in the treatment of many such diseases as cancer, in the early mass detection of conditions such as pulmonary tuberculosis, and in the extension of medical knowledge.

7. Moreover, it appreciates fully the contribution of the radiological profession, through the International Commission on Radiological Protection[2] in recommending maximum permissible levels of irradiation. As regards those whose occupation exposes them to radiation, the establishment of these levels depends on the view that there are doses which, according to present knowledge,

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1/ The radiation due to natural sources has been estimated to cause between 70 and 170 millirem of irradiation to the gonads per annum in most parts of certain countries in which it has been studied, although higher values are found locally in some areas. See the reports "The hazards to man of nuclear and allied radiations" published by the United Kingdom Medical Research Council in June 1956, in which also the millirem is defined; and from information submitted to the Committee.

2/ See the report of the International Commission on Radiological Protection (published in the British Journal of Radiology - Supp. 6, of December 1954 - in the Journal francais d'electro-radiologie - No. 10, of October 1955 - etc. and revised in 1956).

do not cause any appreciable body injury in the irradiated individual; and also on the consideration that the number of people concerned is sufficiently small for the genetic reprecussions upon the population as a whole to be slight. Whenever exposure of the whole population is involved, however, it is considered prudent to limit the dose of radiation received by germinal tissue from all artificial sources to an amount of the order of that received from the natural background radiation.

8. It appears most important therefore that medical irradiations of any form should be restricted to those which are of value and importance, either in investigation or in treatment, so that the irradiation of the population may be minimized without any impairment of the efficient medical use of radiation.

9. The Committee is consequently anxious to receive information through appropriate governmental channels as to the methods and the extent by which such economy in the medical use of radiation can be achieved, both by avoiding examinations which are not clearly indicated and by decreasing the exposure to radiation during examinations, particularly if the gonads, or the foetus during pregnancy lie in the direct beam of radiation. It seeks, in particular, to obtain information as to the reduction in radiation of the population which might be achieved by improvements in instrument design by fuller training of personnel, by local shielding of the gonads, by choosing appropriately between radiography and fluoroscopy, and by better administrative arrangements to avoid any necessary repetition of identical examinations.

10. The Committee also seeks the co-operation of the medical profession to make possible an estimate of the total radiation received by the germinal tissue of the population before and during the child-bearing age. It considers it to be essential that standardized methods of measurement, of types at present available, should be widely used to obtain this information and it emphasizes the value of adequate records, maintained by those using radiation medically, by the dental profession, and by the responsible organizations in allowing such radiation exposure to be evaluated. The Committee is convinced that information of this type will make it possible to decrease the total medical irradiation of the population while preserving and increasing the true value of the medical uses of radiation.

SOCIAL SECURITY ACT AMENDMENT

Dentistry could have a significant role under the 1956 amendments to the Social Security Act, which become effective 7/1/57. This legislation provides Federal matching funds for medical care for the recipients of Public Assistance. The Federal medical care matching funds are available for the recipients of four categories of Public Assistance. They are as follows: (1) old age assistance; (2) aid to permanently and totally disabled; (3) aid to dependent children; and (4) public assistance to needy blind.

In the aged, blind, and permanently disabled the maximum of the expenditures for medical care, in which the Federal government will share on a fifty-fifty basis, is at the rate of $6.00 a month per recipient. In the program for aid

to dependent children the maximum rate is $6.00 a month for adult relatives who are recipients, and $3.00 per month for child recipients. In order to receive the maximum Federal money each state must show expenditures for medical services to recipients in the four categories equal to the requested matching funds. Each state may determine the scope of services included in the matching program, but any service included must be available to all of this Public Assistance group throughout the state. Each state is allowed to determine under state laws and regulations, the qualifications of the physicians, dentists, and venders of services. In some state health departments there are medical care programs which might be included under Federal matching provided legal and budgetary provisions are made to enable the welfare department to accept these funds and enter into a contract with the state health department for provision of the service. The role of dentistry in such a program could be rather significant. The Federal funds are appropriated for "medical services." These services are defined roughly as those "services rendered by a licensed practitioner in the healing arts in the state." It is left to the state administration to determine how the appropriations are to be expended within that definition. States will very likely vary widely within this framework. The Federal legislation is broad enough to include dentistry. Whether or not dentistry is included in a particular state program depends on the state.

Dentistry has a part to contribute in medical care and the state dental association should offer their services to the state welfare department in order to assist in the planning stage of the program. It seems very desirable that the state dental association should offer consultation in any such program, since the members of the association will be the eventual providers of services rendered.

In at least one state a dentist has been employed by the welfare department on its medical assistance staff. In the same state a contract has been written between the state welfare agency and the state dental service corporation, a service program existing within the state dental association to provide dental services to various purchasing groups.

In another state the welfare agency of the state has contacted the state dental association to discuss a proposal of providing a dental care program and aid to dependent children. This state dental association is, at the present time, considering the establishment of a non-profit corporation to provide the dental care.

In another state there is already in existence a very ambitious dental program which is a part of a medical care program. In this particular state the medical program is a part of the state health department. The dental phase of the medical care program last year provided treatment for over 6,000 patients at a sum of $62,596. The dentists who participate are reimbursed on a fee per service basis.

The above are examples of some of the activities presently planned and being conducted. If dentistry is included, and it should be, there should be a systematically planned program for and with the dentist.

BOOK REVIEW

Baltimore Sunday Sun 5/5/57.

A BIASED CRITICISM OF FLUORIDATION

The American Fluoridation Experiment. By F. B. Exner, M. D. and G. L. Waldbott, M. D. 277 pages. Devin-Adair. $3.75.

Any decision as to the validity of the premises of this book--that the addition of controlled amounts of fluoride to public water supplies is dangerous, that it does not accomplish any good purpose, and that it is a violation of personal rights--should be based on review and evaluation of both sides of what has become a very controversial issue.

How stupendous such a review would be is clearly indicated by the length of the list of references cited by the authors. Since a large part of these references are to materials definitely "anti-fluoridation" in character, any such review and subsequent evaluation should be combined with review of the even more voluminous references to literature favoring fluoridation as a safe, effective and economical public health practice. Such, indeed, would be a doubly stupendous task and one not likely to be carried out by many persons.

THE BACKERS AND FOES

Perhaps an alternative method (even if less thorough) to this suggested complete review may be a consideration of the numbers and backgrounds of both the proponents and opponents of fluoridation. That the proponent members of scientific and health profession organizations outnumber opponents will, one may feel confident, be admitted even by the most rabid anti-fluoridationists, including the authors of this book.

As for backgrounds, it should be equally admissible that the knowledge and the experience of the thousands of eminent scientists--dentists, physicians, chemists, engineers--who indorse fluoridation, equal and, in many cases, exceed those of the opponents, again including the authors.

"A DANGEROUS BOOK"

The total overall bias of the book is in no way better attested than by the effort of the authors to cast doubt on the competency of all scientists who indorse fluoridation, while opposition opinions are depicted as the very essence of science; by their calling proponents' opinions of research data misinterpretation, while designating their own opinions of the same data as unquestionably sound and correct; and by their maligning the integrity of such internationally recognized scientists as Dean, Knutson, Arnold, McClure and others while objecting to "scurrilous attacks" reported (without specific details) as having been made by fluoridation proponents on various opponents to fluoridation.

To this reviewer, proud of the widespread acceptance in Maryland of fluoridation as a valuable public health measure, this book is a dangerous one. That it will be read, that its statements will be accepted by some as

completely valid, and that it will be quoted in anti-fluoridation campaigns is to be expected. Thus it may influence a delay in the inauguration of fluoridation projects. That such influence will be minimal should be the hope of those interested in safely and economically reducing in tomorrow's children the incidence of childhood's most prevalent malady, tooth decay.

Richard C. Leonard,
D. D. S., M. S. P. H.

MICHIGAN MAKES MOVIE

The Michigan State Dental Association in cooperation with the Dental Division of the Michigan Department of Health has just released

THE TRUTH ABOUT FLUORIDATION

This is a moving picture with color, sound, and background music. It tells the story of water fluoridation in Grand Rapids, Michigan, from the time the procedure started in 1945 until the present.

The scientific facts are presented in an interesting and entertaining manner, which results in an appealing story.

Those who have seen this film feel that it is the best that has so far been produced on the subject of fluoridation and that it will be of great help in overcoming many of the doubts that exist in the minds of reasonable people.

A dentist states: "This is the best movie on fluoridation that I have ever seen. It tells more in twelve minutes than I could explain in a week. In short, it tells the entire story of fluoridation and it tells it exceptionally well."

Every health department and dental society should have a copy of this film.

THE TRUTH ABOUT FLUORIDATION may be purchased from the Michigan State Dental Association, 112 E. Allegan St., Lansing, Michigan, for $125.00 per copy.

AST AGAIN HONORED

At an Albany dinner meeting of the Third District Dental Society, Dr. David B. Ast, Director of the Health Department's Bureau of Dental Health, was cited for his services to the people of the State.

The plaque awarded to Doctor Ast on the occasion read: "David Bernard Ast, Colleague, Scholar, Administrator - in recognition of his outstanding

contribution to Dentistry through his pioneering direction of the Fluoridation, Dental Rehabilitation and general Dental Health Services for the people in New York State."

Dr. Morton Levin, Assistant Commissioner for the Department's Division of Medical Services, was the main speaker at the meeting.

Doctor Ast is also the recipient of the Governor Alfred E. Smith Award for outstanding administrative achievements given by the Capital District Chapter of the American Society for Public Administration and of the Worcester (Mass.) District Dental Society Award.

WHAT PRICE EDUCATION?

From Dr. Frank I. Livingston, New Hampshire Dental Director, comes the following A. P. news story from the February 14, 1957, Concord (N. H.) Monitor and Manchester Leader.

> BOY LIKES CIGAR AND AVOIDS CANDY
>
> Manchester, Feb. 14 (AP)--A 9-year-old local boy is not taking any chances with his teeth.
>
> The youngster was brought to police headquarters yesterday when he was found smoking a rather long cigar.
>
> A police officer assigned to take the boy home asked him why he didn't spend his money on candy or ice cream rather than cigars.
>
> Replied the youth, seriously: "What, and get cavities in my teeth?"

Asks Frank, "Who says dental health education doesn't pay off?"

ELECTED

The Kansas City Star of March 4, 1957, reports the election of Dr. Willard R. Bellinger, Kansas State Dental Director, to the office of second vice-president of the Alumni Association of the Kansas City University Dental School. Felicitations to Bill and congratulations to the Alumni Association.

INVENTION REDUCES FLUORIDATION COST

A device which will lower the cost of adding fluoride to city water supplies has been developed by two Public Health Service scientists.

The new dissolver makes it possible to use fluorspar, the most inexpensive form of fluoride, which is used in preventing tooth decay. The cost per pound of fluoride ion in fluorspar is 4.3 cents. The cost per pound of fluoride ion in other compounds used in fluoridation ranges from 44.5 cents for hydrofluosilicic acid to 12.5 cents for silicofluoride. In the larger cities, the use of fluorspar can mean substantial savings; the estimated cut in costs for Washington, D. C., for example, is about $50,000 annually.

The apparatus was developed by F. J. Maier, sanitary engineer director, and E. Bellack, both of the Division of Dental Public Health of the Public Health Service. Six months of testing preceded release of the device.

Previously, fluorspar was impractical for use in water supplies, because it does not dissolve readily. When this compound is used in the tanklike dissolver, an alum solution is fed into the device and an agitator keeps the fluorspar in suspension to help the dissolving process. The resulting solution is drawn off and fed into the water system.

Manufacture of the equipment by private industry is expected to begin in the near future.

FLUORIDATION QUOTES

"The unscrupulous opponents of fluoridation have spread the impression that the American Medical Association did not endorse this public health measure. The fact is that it did, and it stands by its endorsement.

"Both the A. M. A. Council on Pharmacy and Chemistry and A. M. A. Council on Food and Nutrition have expressed themselves definitely to the effect that fluoridation is safe."

George F. Lull, M. D., Secretary and
General Manager, American Medical Ass'n.

* * * * * *

"No department of preventive medicine expresses the opinion that fluoride in proper quantities will harm the human organism."

Dr. Robert D. Wright, Chairman, Department
of Preventive Medicine, University of
Virginia

* * * * * *

"The Public Health Service has long endorsed the fluoridation of public water supplies as a safe, effective and economical procedure for the partial prevention of tooth decay."

Leonard A. Scheele, M. D., Surgeon General
Public Health Service, U. S. Department
of Health, Education, and Welfare

* * * * * *

"Fluoride is perfectly safe in an amount of one part in a million, as evidenced by three million people who have been drinking such fluoridated water for many decades."

Henry M. Helmholz, M. D., Chairman
of the National Congress of Parents'
and Teachers' Committee on Health,
formerly head of the section on
pediatrics of the Mayo Clinic for
25 years.

* * * * * *

"The evidence as a whole is consistent in offering assurance that bringing the fluoride concentration in communal water supplies to that known to be optimal for dental health is a prophylactic public health procedure which has an ample margin of safety."

Francis F. Heyroth, M. D., Asst. Director,
Kettering Laboratory, Dept. of
Preventive Medicine & Industrial
Health, College of Medicine,
University of Cincinnati, Cincinnati,
Ohio.

* * * * * *

"By fluoridating their water supplies, communities can now assure parents that their children will have fewer cavities and more attractive teeth for life. They can do this with perfect confidence that fluoridation will not injure anybody's health in any way."

Dr. Thomas L. Hagan, Chief, Division
of Dental Public Health, U. S. Public
Health Service

* * * * * *

"It has been found, without exception, that where fluoride is present in water supplies at a concentration of approximately one part per million there will be only about one-third as many decayed teeth as in those areas where the drinking water is deficient in fluoride.

"Speaking now as a chemist, I would like to point out the nature of fluoride as it occurs in the water supply. The first fact to be kept in mind is one which is self-evident to chemists; namely, the fact that there is no synthetic element, fluorine. All fluorine is natural fluorine .... There is no "synthetic" or "artificial" fluoride ion and the fluoride ion is identical whether it be derived from sodium fluoride in a controlled addition procedure or be added incidentally when water trickles over or through the earth prior to its collection from a reservoir or well. It is obvious, therefore, that controlled fluoridation is simply an extension of a natural procedure."

J. Roy Doty, Ph.D., Secretary, Council on Dental Therapeutics, American Dental Association, Chicago, Illinois

* * * * * *

"It can be stated categorically that there is not a shred of scientific evidence to the effect that sodium fluoride in drinking water in concentrations not exceeding one part per million (the amount normally employed) has any deleterious effects upon the health of the people. On the contrary, it has been demonstrated to the satisfaction of every scientific organization in the country with an interest in and knowledge about dental health that children reared in communities where the drinking water contains approximately one part per million of fluorine have only about one-third as much dental caries as those reared in communities where water supplies are fluorine free."

Thomas Parran, M. D., Dean, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, Penn.

* * * * * *

" ..... there are no physical or chemical differences of any kind between fluorides naturally present in the water and fluorides being added in any of the forms presently being used in this country."

A. P. Black, Head, Department of Chemistry, University of Florida, Gainesville, Fla.

* * * * * *

"Fluoridation has proved highly effective in curbing tooth decay and is completely harmless to health."

Dr. Frederick J. Stare, Chairman, Department of Nutrition, Harvard School of Public Health, Cambridge, Mass.

* * * * * *

"The mean concentration of fluorine in fourteen deep wells of Green Bay and surrounding areas is 2.1 ppm ..... I have inquired of many of the physicians in this area, asking them if they had noted any untoward effects from that degree of concentration of fluorine and all have stated that in their experience there have been no deleterious effects on the health of the people. In my own experience, I have performed many autopsies in this area and have seen no pathologic effect that might be attributed to this concentration of fluorine."

Dr. J. L. Ford, Pathologist,
St. Vincent's Hospital, Green Bay,
Wisconsin

* * * * * *

" ..... We have received no reports from either physicians or health officers in regard to complications from the use of fluorides in public water supplies. At this time we have 18 cities and villages in the southwestern part of the state using fluorides in their water supplies. Although routine checks are made with water superintendents, we have had no report of illness or intoxication or any other untoward effects traceable to the use of fluorides in these water systems."

Dr. Pierce D. Nelson, Director,
Division of Tuberculosis Control, State
Board of Health, Madison, Wisconsin

* * * * * *

"A measure to control dental caries is now available in the fluoridation of community water supplies. Water fluoridation is no longer in the pioneering experimental stage. It is economically feasible, no technical difficulties have been encountered, and its effectiveness has been demonstrated."

H. Trendley Dean, Secretary, Council
on Dental Research, American Dental
Association

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A STATEMENT BY COUNCILMAN JAMES H. LINCOLN

A "Statement by Councilman James H. Lincoln - City of Detroit, Michigan - Concerning Fluoridation of Water, December, 1956" accompanies this Bulletin.

This is a report of an investigation conducted by a city official who was opposed to fluoridation in 1954. A careful, scientific study of the facts changed him into an ardent supporter.

Quantities of this article may be obtained at a nominal price from the Cowdin Printing Co., 159 E. Elizabeth St., Detroit, Michigan.

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STATE HEALTH DEPARTMENT DENTAL DIVISION STATUS*

Question # 1. State or Territory	2		3		4		5 **	6 ***		7				8	9		10	
	a	b	a	b	a	b		a	b	a	b	c	d	Years	a	b	a	b
Alabama		X	X		X				X		X		X	25	Same		X	
Arkansas	X		X		X			X			X	X		4		X	X	
California	X		X		X			X		X				8	X		X	
Colorado	X		X		X			See footnote						6	X		X	
Connecticut		X	X		X				X		X		X	5	X		X	
Georgia	X		X		X			X			X		X	4	X		X	
Idaho		X	X		X			X			X		X	1.5	X		X	
Illinois	X		X		X			X			X		X	15	X		X	
Indiana	X		X		X				X	X				12	X		X	
Hawaii	X		X		X			X		See footnote				7	ft.n.		X	
Maine		X	X		X			X		X				35	X		X	
Maryland	X		X		X				X		X		X	5		X	X	
Michigan	X		X		X			X		X				1	X		X	
Missouri	ft.n.		X		X			X			X		X	8	X		X	
Montana	X		X		X			X		See footnote				10	X		X	
Nebraska	X		X		X			X		X				5	X		X	
Nevada	X		X		X			X			X		X	14	X		X	
New Mexico		X	X		X			X		X				3.5	Same		X	
New York		X	X		X				X	X				8	X		X	
Oklahoma	X		X		X			X		X				8	X		X	
Oregon	X		X		X				X	X				11	X		X	
Penn.	X		X		X				X		X		X	4		X	X	
P. Rico	ft.n.		X		X				X	See footnote				7.5	X		X	
S. Dakota	X		X		X			X		X				10	Same		X	
Tennessee	X		X		X			X		X				2	X		X	
Texas	X		X		X			X		X				See Ft.N.			X	
Washington	X		X		X				X	X				8	Same			
W. Virginia	X		X		X			X		X				12	X		X	
State 29	X		X		X				X	X				17	X			X
State 30	X		X		X			X			X		X	20	Same			X
State 31	X		X		X			X			X		X	20	Same			X
TOTALS	23	6	31		31			20	10	15	12	1	11		20	3	28	3

*See reverse side for all footnotes.

STATE HEALTH DEPARTMENT DENTAL DIVISION STATUS

Below, in modified form, will be found the queries contained in the questionnaire issued in the November 1956 Bulletin. On page 59 will be found a compilation of the data given in the 31 replies received.

1. Name of State?
2. Dental member on State Board of Health? (a) Yes (b) No
3. Does State Health Department have dental health program? (a) Yes (b) No
4. Is it directed by a dentist? (a) Yes (b) No
5. If not by dentist, by whom? (a) D. H. (b) M. D. (c) Nurse (d) Other
6. Dental director responsible to (a) Department's director?
   (b) Intermediary physician?
   (c) Other
7. Dental director's range in comparison with others of same administrative level:
   (a) same? (b) differs? (c) more? (d) less?
8. Length (years) of present organization status?
9. Present status: (a) Lower to higher (b) Higher to lower
10. Designation of State? (a) By name (b) By number

Footnotes to the tabulated data are as follow:

* From data submitted in 31 replies
** No replies listed dental health programs directed by other than dentists
*** No replies listed responsibility to other than "Department's Director" or "an intermediary - who is" a physician

Footnotes (in order of vertical appearance)

1 1. Colorado (questions 6 and 7) - dental director serves in dual capacity of Chief, "Division of Special Health Services" and, within that Division, dental health services.

2. Hawaii (questions 7 and 9) - salary levels based on number of personnel supervised. The dental health program established in 1949; activated, 1955.

3. Montana (question 7) - question deemed "ambiguous." Reply indicates dental director's salary higher than some, lower than others of same administrative level.

4. Puerto Rico (questions 2 and 7) - no answers given.

5. Texas (questions 8 and 9) - new Director expresses uncertainty regarding answers.

) No

Other

y